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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,773	08/08/2006	Toshihiro Iwakuma	292948US0PCT	4654
22850	7590	12/30/2009	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			YANG, JAY	
			ART UNIT	PAPER NUMBER
			1794	
			NOTIFICATION DATE	DELIVERY MODE
			12/30/2009	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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jgardner@oblon.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/588,773	<b>Applicant(s)</b> IWAKUMA ET AL.	
	<b>Examiner</b> JACK YANG	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.   | 6) <input type="checkbox"/> Other: ____.                          |

### **DETAILED ACTION**

1. This Office Action is in response to the amendments/arguments filed September 02, 2009.

#### ***Response to Amendment***

1. The rejection of Claim 20 under 35 U.S.C. 102(b) as being anticipated by Higashi et al. in the Office Action mailed June 02, 2009 is overcome by cancellation of the claim.
2. The rejection of Claims 19 and 21 under 35 U.S.C. 102(b) as being anticipated by Higashi et al. in the Office Action mailed June 02, 2009 is overcome by amendment of Claim 19.

#### ***Claim Rejections – 35 USC § 102***

1. Claim 23 stand rejected under 35 U.S.C. 102(b) as being anticipated by Higashi et al. (US 6,617,051 B1).

Higashi et al. discloses a wide variety of light-emitting material for the light-emitting layer (col. 9-10) that can also be used as host material (col. 22, lines 36-37). As mentioned above in this section, Higashi et al. discloses an expected halogen impurity concentration range from its production to be between 0-1000 ppm (col. 32, lines 39-49), which read on the claim. The method of detecting possible impurities in the material, in which "the halogen element mass concentrations of bromine, iodine, and chlorine as impurities are identified respectively by inductively coupled plasma-mass spectrometry (ICP-MS analysis) or a coulometric titration method," adds no further limitations to this claim and thus does not differentiate it from the prior art.

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***Claim Rejections – 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-6, 8-10, 12, 14-19, 21, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higashi et al. (US 6,617,051 B1) and further in view of Begley et al. (US 2005/0095453 A1) (Claims 1-6, 8-10, 12, 14-18, 22, and 24 stand rejected as described in the Office Action mailed June 02, 2009).

Regarding Claims 1-5, 17, 19, and 21, Higashi et al. discloses an organic EL device comprising an organic compound layer including an organic emitting layer sandwiched between a pair of electrodes, in which that organic compound layer is formed from an organic compound material having an impurity concentration of 0 ppm (col. 46, Claim 17). Higashi et al. discloses a doping method for efficient mixed emission using a host material and a fluorescent dye dopant for the light-emitting layer (col. 22, lines 33-38). Higashi, et al. further discloses that the impurities in the organic

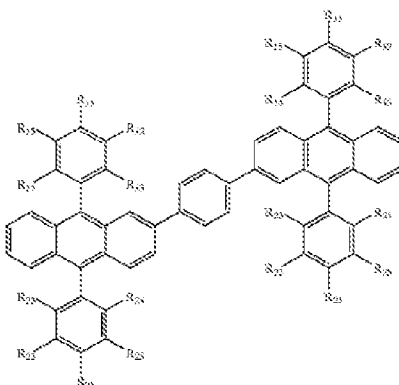
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compound material (including the host) include halogen compounds (col. 29, lines 59-63). Higashi et al., however, does not disclose a dopant that is a phosphorescent organic metal complex.

Begley et al. discloses a light-emitting layer of an organic EL device comprising of a host material doped with a guest compound, in which the dopant can be chosen from phosphorescent metal complexes ([0115]). Since each individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the fluorescent dye dopant as disclosed by Higashi et al. for a phosphorescent metal complex as disclosed by Begley et al. Thus, the simple substitution of one known element for another producing a predictable result results the claim obvious. It should be noted that the method of detecting impurities in the organic EL device as described in Claim 17, in which "the halogen element mass concentrations described above is identified respectively by inductively coupled plasma-mass spectrometry (ICP-MS analysis) or a coulometric titration method" adds no further limitations to this claim and thus does not differentiate it from the prior art.

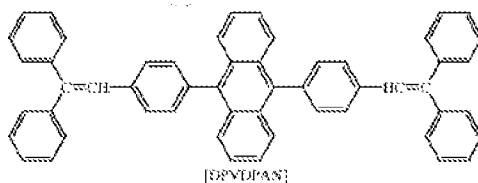
Regarding Claims 6, 8, 12, and 14, Higashi et al. discloses the following host material in the light-emitting layer:

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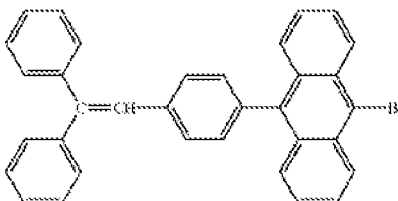


(col. 10) where  $R_{11} - R_{25}$  = alkyl such that  $Ar' =$  phenylene,  $R_A = R_B =$  aromatic hydrocarbon group with 14 carbon ring atoms substituted with 2 phenyl groups.

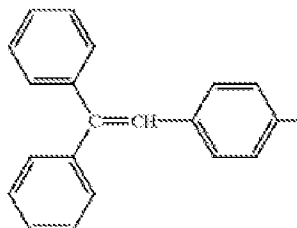
Regarding Claims 9, 10, 15, and 16, Higashi et al. discloses the following compound for host material (as well as light-emitting material) in the light-emitting layer:



(col. 38) and subsequently discloses in its synthesis the possibility of producing the following impurity that can be present:



(col. 39) such that  $Ar = Ar' =$  anthracene,  $X_1 = Br$ ,  $R_A =$  shown below:



, and  $X_2 = H$  such that it satisfies Formula (3) of Claim 9 and Formula (6) of Claim 10.

Regarding Claim 18, Higashi et al. discloses an electron transport/injection material Alq that is placed adjacent (col. 3, lines 20-21) to the light-emitting layer that is free from any impurities (pure, col. 41, Table 2, Examples 1-7).

Regarding Claim 22, Higashi et al. discloses a wide variety of light-emitting material for the light-emitting layer (col. 9-10) for an organic EL device such that its halogen impurity as mentioned above in the 102(b) rejection is between 0-1000 ppm (col. 32, lines 39-49). Higashi, et al., however, does not disclose a phosphorescent organic metal complex. Begley et al. discloses the use of phosphorescent metal complexes for organic EL devices as light-emitting material (dopants) ([0115]). Since each individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the light-emitting material as disclosed by Higashi et al. for a phosphorescent metal complex as disclosed by Begley et al. Thus, the simple substitution of one known element for another producing a predictable result results the claim obvious.

Regarding Claim 24, Higashi et al. discloses an organic EL device comprising an organic compound layer including an organic emitting layer sandwiched between a pair

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of electrodes. Higashi et al. discloses a doping method for efficient mixed emission using a host material and a fluorescent dye dopant for the organic emitting layer (col. 22, lines 33-38), in which the host material meets the limitations of Claim 23 as described above in the 102(b) rejection, and also such that the halogen impurity concentration of the light-emitting material (dopant) is between 0-1000 ppm (col. 32, lines 39-49). Higashi et al., however, does not disclose a phosphorescent organic metal complex. Begley et al. discloses the phosphorescent organic metal complex as a light-emitting material (dopant) as described above in the 103(a) rejection. Since each individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the fluorescent dye dopant as disclosed by Higashi et al. for a phosphorescent metal complex as disclosed by Begley et al. Thus, the simple substitution of one known element for another producing a predictable result results the claim obvious.

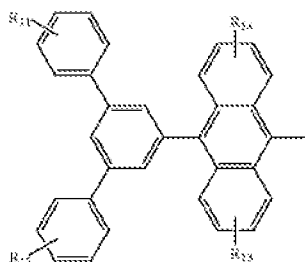
3. Claims 7, 11, and 13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Higashi et al. (US 6,617,051 B1) and further in view of Begley et al. (US 2005/0095453 A1) and Hu et al. (US 6,479,172 B2) as described in the Office Action mailed June 02, 2009.

Higashi et al. in view of Begley et al. disclose the organic EL device as described in Claim 6. They do not, however, disclose an aromatic hydrocarbon represented by



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Formula (1) where Ar = benzentriyl, pyridinetriyl, pyrimidinetriyl, or triazinetriyl and R<sub>A</sub>, R<sub>B</sub>, and R<sub>C</sub> represent independently a substituted or non-substituted aromatic hydrocarbon group having 6-30 ring carbon atoms, a substituted or non-substituted aromatic heterocyclic group having 3-20 ring carbon atoms or a substituted or non-substituted amino group, and where R<sub>A</sub>, R<sub>B</sub>, and R<sub>C</sub> each may be the same or different, and adjacent ones may be combined with each other. Hu et al. discloses the following compound:



(col. 6) with R<sub>11</sub>, R<sub>12</sub>, R<sub>13</sub>, and R<sub>14</sub> = H such that Ar = benzentriyl, R<sub>A</sub> = phenyl, R<sub>B</sub> = phenyl, R<sub>C</sub> = methyl anthracene as a hydrocarbon compound for host material for an organic EL device (col. 4, lines 16-18). Since each individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the disclosed host material of the organic EL device as disclosed by Higashi et al. in view of Begley et al. for the host material as disclosed by Hu et al. Thus, the simple substitution of one known element for another producing a predictable result results the claim obvious.

### ***Response to Arguments***

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1. Applicant's arguments filed on September 02, 2009 have been fully considered but they are found to be not persuasive.
2. Applicant has requested the withdrawal of Claim 23 on page 11 due to the amending of Claim 19. However, Claim 23 has not been amended nor is a dependent of Claim 19 to warrant a withdrawal of the rejection.
3. Applicant has argued on page 13 regarding Claims 1-18, 22, and 24 that Higashi et al. discloses a fluorescent dopant in combination with a host material in the light-emitting layer in contrast to the claimed phosphorescent dopant. However, in response to the applicant's argument against Higashi et al. individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).
4. Applicant has further argued against obviousness by combining Higashi et al. in view of Begley et al. and/or Hu et al. by the showing of unexpected results on page 16 where an enhancement of lifetimes by factors ranging from 5.2-101 have been found in contrast to the enhancement of lifetimes found in Higashi et al. of 1.1-2.0. However, it is the position of the Examiner that such data cannot be used to show an improvement and thus unexpected results over the embodiments as disclosed by Higashi et al. in Table 2 (col. 41). That is because it is clear that the enhancement of lifetimes is highly dependent on the nature of the materials used in the organic EL device (and not just the halogen contamination levels). To illustrate this point, the halogen contamination levels decrease by factors of  $(357 \text{ ppm})/(29 \text{ ppm}) = 12.3$  and  $(498 \text{ ppm})/(24 \text{ ppm}) = 20.8$  in

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{Comp. Ex. 1 and Ex. 1} and {Comp. Ex. 2 and Ex. 2}, respectively, while corresponding lifetimes factors between {Comp. Ex. 1 and Ex. 1} and {Comp. Ex. 2 and Ex. 2} differ by more than  $101/6.7 = 15.1$ . This clearly indicates that it is the construction and particular species of components of the organic EL device used rather than the contamination levels that determine lifetime improvement factors. Thus, since Higashi also uses sublimation to purify the organic EL device components and comparing lifetimes data between that of Higashi and that of the applicant cannot be reasonably be applied, the rejection stands.

### ***Conclusion***

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACK YANG whose telephone number is (571)270-1137. The examiner can normally be reached on Monday to Thursday from 8:30 am to 6:00 pm Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on (571)272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/  
Supervisory Patent Examiner, Art Unit 1794

/J. Y./  
Examiner, Art Unit 1794